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OBSERVATIONS ON TORTICOLLIS,

WITH PARTICULAR REFERENCE TO THE

SIGNIFICANCE OF THE SO-CALLED HEMATOMA
OF THE STERNO-MASTOID MUSCLE.

BY

ROYAL WHITMAN, M.D., M.R.C.S.,
ASSISTANT SURGEON TO OUT-PATIENTS, HOSPITAL FOR RUPTURED AND CRIPPLED,

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OBSERVATIONS ON TORTICOLLIS, WITH PARTICULAR REFERENCE TO THE SIGNIFICANCE OF THE SO-CALLED HEMATOMA OF THE STERNO-MASTOID MUSCLE.¹

BY ROYAL WHITMAN, M.D., M.R.C.S.,
ASSISTANT SURGEON TO OUT-PATIENTS, HOSPITAL FOR RUPTURED AND
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ASSUMING that the treatment of any affection must to a great extent depend upon our apprehension of the causes that produce it, I shall call your attention more particularly to etiology, the conclusions being influenced by clinical investigation rather than by recorded theories.

That the bearing of these conclusions on the question indicated by the title of this paper may be clearly understood, I quote from several of the more prominent writers on the subject. F. Busch,² for example, says: "Congenital wry-neck is caused, as Stromeyer was the first to show and as is now acknowledged, almost without exception by injury to the sterno cleido-mastoid muscle at birth, and by subsequent shortening at the place of injury by scar-contraction. The deformity occurs almost ex-

¹ Read at the meeting of the American Orthopedic Association in Washington, September, 1891.

² Von Ziemssen's Handb. der allg. Ther.

clusively in children delivered by forceps, or more frequently in breech or foot presentations."

In the *Deutsche Chirurgie*¹ the subject is treated by Fisher as follows: "It is certain that tearing of muscle at birth, as Stromeyer has shown, is a frequent cause of torticollis. A tumor appears at the seat of the injury a few weeks after birth, which slowly disappears, leaving shortening by scar-contraction."

Volkmann and Vollert² have resected and examined portions of muscle in cases of supposed congenital torticollis. In some no change was apparent; in others the muscular substance had entirely disappeared to be replaced by fibrous tissue; while in the remainder the fibrous degeneration was diffuse, as shown by bands in the muscle substance. These changes they regard as the result of myositis caused by injury at birth. While these observations are of value as showing changes that may occur in persistent wry-neck, they can have but little bearing on the question under consideration, as no evidence is presented of original injury or of subsequent induration, and because similar changes are found in cases of acquired torticollis of long duration, as reported by Robert, Marchessaux, Bouvier, and Witzel.³

It is evident that the term injury is not used by these and other writers in a general sense, but applies to partial rupture of the sterno-mastoid muscle

¹ Bd. xxxiv. S. 32.

² Centralbl. f. Chir., No. 14, 1885, No. 38, 1890.

³ Deutsche Archiv f. Chir., 1882, p. 181.

—caused, it would appear, by torsion¹ of the neck during delivery of the head, followed by effusion of blood,² and later by an encapsulating inflammation³ at the seat of the injury, as shown by a hard, painless tumor in the substance of the muscle. This induration slowly disappears, to be replaced by fibrous tissue, which, contracting, creates permanent torticollis—in other words, a purely mechanical shortening, as distinct from the nerve irritation and spasm that we usually associate with wry-neck. As to the first part of this proposition—that injury of muscle may occur during labor, and that it is followed by induration at the seat of the rupture—there can be no doubt but that such rupture is followed by scar-contraction; that it is the usual cause of congenital torticollis is extremely improbable. A partial subcutaneous rupture of a normal muscle would seem to present every requisite for quick and perfect repair. Scar-contraction never follows similar injuries in later life, nor do we find in other situations anything analogous after injury at birth. If, then, we are to accept this theory, it would seem that the supporting evidence should be very direct and conclusive, such as the recorded observations of a number of cases—from the original injury, with its succeeding induration and scar-contraction, to the persistent torticollis which is supposed to result. Such evidence, however, is not contained in the literature of the subject, although the theory—

¹ Küstner: *Centralbl. f. Gyn.*, No. 9, 1886.

² Bouchut: *Traité prat. de Mal. de Nouv.-nées*, Paris, 1875.

³ Skrzeczka: *Vierteljahrsschrift f. Gyn. u. obst. Med.*, 1869, S. 129. Hüttenbrenner: *Lehrb. f. Kinderheilk.*, 1886.

originating fifty years ago with Stromeyer¹ and Dieffenbach—has been endorsed by nearly² all subsequent writers, gathering weight, it would appear, by reiteration, rather than from actual investigation. It should be stated that this theory of the origin of congenital torticollis has been vigorously combated by Peterson³ and flatly denied by Weiss,⁴ as follows: “Ruptures of the sterno-mastoid muscles are frequent enough during labor, but they are never followed by torticollis, and it is impossible to accept the theory advanced by Stromeyer and Dieffenbach.”

It is apparent that we may obtain reliable evidence on this question from two sources: cases of induration followed to their termination, and cases of supposed congenital torticollis traced back to injury and subsequent induration, if such existed.

In the records of the Hospital for Ruptured and Crippled were found eighteen cases of so-called hematomas; nine could be traced, and of these two were excluded for mistaken diagnosis—the first because the after-history seemed to point to an inflamed gland as the cause of the induration; the second because the mother is positive that no tumor was present at any time. In both instances the torticollis, that was the prominent symptom, quickly and permanently disappeared. The history and results in the remaining cases are as follows:

CASE I.—A male infant brought to the hospital on August 26, 1889, at the age of two months.

¹ Handb. d. Chir., Bd. ii. S. 426.

² Rust's Handb. d. Chir., S. 625.

³ Archiv. f. Chir., Bd. xxx.; Centralbl. f. Gyn., No. 48, 1886.

⁴ Nouv. Dict. de Méd. et de Chir.

Fifth child, delivered by version, arm broken in the act. Three preceding children had died during labor. Tumor, size of a hazel-nut, in the middle of the right sterno-mastoid, hard, not sensitive; noticed by the mother at six weeks; no torticollis; no symptoms. The infant died eighteen days after.

CASE II.—Male, brought on August 16, 1889, at the age of three weeks. First child; delivered by forceps after tedious labor. Tumor, size of a large almond, in the left sterno-mastoid muscle; not sensitive to pressure; noticed at ten days. No torticollis; no symptoms. The swelling disappeared in three months. Child examined at nineteen months; no trace.

CASE III.—Male, seen August 28, 1890, at the age of five weeks. First child; forceps delivery after difficult labor. Tumor, size of a small pigeon's egg, in the middle of the left sterno-mastoid; noticed at three weeks. No torticollis or other symptoms. The swelling disappeared in three months. Examined at the age of nine months; no trace remaining.

CASE IV.—Female, brought September 16, 1890, at eleven weeks. First child; breech presentation. Delivered by a midwife with some difficulty. Tumor in the middle of the right sterno-mastoid, size of a hazel-nut; noticed at eight weeks. No torticollis. The induration disappeared in four months. Examined at eight months; no trace.

CASE V.—Male, seen May 2, 1891, at two months. Breech presentation, spontaneous and easy labor. Tumor size of a hazel-nut in the upper third of the right sterno-mastoid; noticed at three weeks. A gurgling respiration was apparent when the child nursed the left breast. There was no torticollis, though slight resistance on extreme tension of the affected side.

Examined at the age of six months. No torticollis or restriction of motion. No symptoms. Tumor slightly smaller, otherwise unchanged.

CASE VI.—Male, brought July 31, 1891, at seven weeks. Third child, transverse with arm presentation, delivered by version and forceps. Complete paralysis of the right brachial plexus; right inguinal hernia. A spindle-shaped enlargement of the middle third of the right sterno-mastoid, one-half inch in diameter, hard, not sensitive. No torticollis. No symptoms. Last seen September 5, 1891. No apparent change in the tumor.

CASE VII.—Male, seen August 5, 1891, at five weeks. First child; breech presentation, difficult labor. Tumor size of a pigeon's egg, at sternal insertion of the right sterno-mastoid; hard, not sensitive to pressure. No torticollis or other symptoms. Not again examined.

With these I now include six cases recently reported by Quisling,¹ in which the indications correspond to my own, although the actual results were not in all instances ascertained. Thus, of the thirteen cases, nine were originally breech presentations or delivered by version, two were extracted by forceps, and in two there is no history of interference with delivery. Of these cases, examined with especial reference to the subject of torticollis, in none was it present at the first examination, other than the slight limitation that might be supposed to follow a tumor of this size and character in the muscle substance, and in none of the cases traced did it follow. It should be noted, also, that there are on record other instances of complete disappear-

¹ Archiv. f. Kinderheilk., Bd. xii. H. 5, 6, 1891.

ance of these tumors without succeeding deformity, as for example, cases reported by Brooks,¹ by Smith,² by Jacobi,³ and many others.

Having considered the question from the standpoint of original injury, traced to recovery in all the cases cited, we may now invert the method and examine the evidence presented by cases of congenital torticollis pointing to injury at birth as the exciting cause.

At best, such evidence is unsatisfactory, because we must depend upon the mother's statement as to the time when the affection appeared. Infants do not support the head for several weeks after birth, and unless the deformity is extreme it is not noticed until that time. If, then, an infant is brought for examination at the age of six months with a history of torticollis first noticed at four weeks, we may consider it of intra-uterine origin, or that it was acquired during the first month of life, or caused by injury at birth. If we favor the first conclusion, then congenital torticollis must be divided into two classes.

First, cases of slight deformity, with no pain and but little spasm, except on extreme tension of the contracted parts, the contraction not being limited to the sterno-mastoid, but all the lateral tissues being involved. The resistance is not marked and the deformity can be easily overcome in a short time by stretching and manipulation. These cases are very similar to the mild condition of talipes calcaneus or

¹ N. Y. Med. Record, February 27, 1886.

² Trans. Lond. Path. Society, iv. p. 70.

³ Archives of Pediatrics, March, 1888.

of incomplete extension of arms or legs, equally amenable to treatment, whose origin would seem to be a constrained position *in utero*, leading to general shortening of tissues on the one aspect, with weakening and lengthening on the opposing surface.

The second class is composed of cases where the deformity is more marked. It cannot be overcome by simple means, but persists and increases. The sterno-mastoid may alone be affected, or the posterior group of muscles, with compensatory curvature of the spine and displacement of the scapula, as in one case now under observation. Here, we may infer, there is an actual arrest of development or muscle-degeneration, arising, it may be, from causes more complex than appear in the preceding cases.¹

In regard to rupture of muscle as a possible cause, it may be said that the tumor of true hematoma is so prominent when the child turns the head, that it could hardly escape the mother's notice, and her statement in this regard may be accepted as final. During the past six months I have had the opportunity of examining four cases of congenital torticollis in young infants, three of the first class and one of the second. Although there was a history of transverse presentation in one of the milder cases, in none of these, nor in those seen in later life, was there history or evidence of hematoma or of difficulty in delivery or probability of injury at birth.

In considering the significance of hematoma, so called, several sources of error should be indicated, as leading to the present confusion on this subject :

¹ Archives de Tocologie, xv. p. 494.

1. A muscle shortened *in utero* may be ruptured at birth, thus presenting a deformity where the induration is a coincidence and not a cause.¹ Such a case was reported by Bruns² at the last Congress of German Surgeons.

2. An inflamed gland, adherent to the muscle, with torticollis from nerve irritation, may be mistaken for hematoma, as in the case mentioned.

3. Similar enlargements may in certain instances be of other origin than injury—such as fibrous, sarcomatous,³ or syphilitic tumors, arising, it may be, *in utero*. Cases reported by Graser, Taylor,⁴ Hadra,⁵ and Holmes⁶ would seem to support this view.

It is possible, too, that injury in a tuberculous or syphilitic child might give rise to a myositis sufficiently exaggerated to cause permanent arrest of development and actual shortening.

In regard to injury in general, this is undoubtedly an occasional cause of acquired torticollis. It might operate at birth as in later life, and hematoma might be a coincidence, or we may fancy that fibers of the spinal accessory nerve might be involved in the induration following muscle rupture, with irritative spasm as a result. These, however, are simply conjectures, and are entirely distinct from the question of scar-contraction that we are considering. It may be objected that the

¹ Rennecke: Centralbl. für Gyn., No. 22, 1886

² Centralbl. für Chir., No. 26, 1891.

³ Graser: Münch. med. Wochensch., No. 13, 1887.

⁴ Trans. Lond. Path. Society, xxvi. p. 224.

⁵ N. Y. Med. Record, January 23, 1886.

⁶ Diseases of Childhood and Infancy.

negative evidence presented is of ^{little}~~some~~ value, compared with positive observations to the contrary, but it must be remembered that we are considering the usual and not the exceptional causes of wry-neck, and that neither Stromeyer nor any of the succeeding writers who have endorsed this theory have presented a single undoubted case in its support.¹ Of the hypothesis, then, that explains the origin of congenital torticollis by muscle rupture, myositis, scar-contraction, and permanent shortening, we may conclude that it is simply an assertion unsupported by evidence. Further, I am convinced that injury at birth, of whatever nature or extent, is a possible, and not a probable, factor in the etiology.

From the hospital records of the past nineteen years I have collected 264 cases of wry-neck. During this time² upwards of 3400 cases of congenital and acquired club foot came under observation—a comparison that will show the relative infrequency of the affection under consideration.

The following is a brief summary of some of the points of apparent interest.

Of the 264 cases 32 may be considered as congenital, with the reservation before mentioned. As to sex, 155 were females and 109 males, which would tend to disprove the statement that the affection is much more common in males than females. In 77 it might be considered as acute, and in 60 chronic, in 48 having existed for from one to twenty years.

¹ Peterson: *Zeitschrift f. orthopäed. Chir.*, B. i. H. I.

² Townsend: "Statistical Paper on Club-foot," *Trans. N. Y. State Med. Soc.*, 1890.

OBSERVATIONS ON TORTICOLLIS. 11

Excluding congenital cases, the duration of the affection was mentioned in 137 instances.

The affected side was mentioned in 187 instances. In 98 it was on the right, and in 97 upon the left side, in contrast to the assertion that it is much more frequent on the right than the left side. Early childhood is the time of greatest susceptibility, but ten cases are noted at more than eighteen years of age.

In 106 cases of acquired torticollis the cause seemed apparent. Of these nearly 50 per cent. might fairly be classed as from cervical gland irritation, often after some contagious disease.

Age and sex of patient when first seen :

Age.	Males.	Females.	Total.
Congenital (?)	14	18	32
6 months or less	4	4	8
1 year	4	5	9
2 years	7	9	16
3 "	3	4	7
4 "	7	9	16
5 "	11	13	24
6 "	9	14	23
7 "	9	15	24
8 "	9	10	19
9 "	3	17	20
10 "	13	7	20
11 "	2	8	10
12 "	2	7	9
13 "	2	3	5
14 "	1	4	5
15 "	3	2	5
17 " . . . . .	..	1	1
18 "	1	...	1
Over 21 years	5	5	10
Total	109	155	264

The duration of acquired torticollis when the cases were first seen :

	Acute.	Chronic.
1 month or less	49	...
2 months or less	20	...
" " 	8	...
6 " " . . . .	...	17
From 6 months to 1 year . . . .	...	13
" 1 year to 2 years . . . .	...	8
" 2 years to 3 years . . . .	...	7
" 3 " 4 " . . . .	...	...
" 4 " 5 " . . . .	...	7
" 5 " 6 " . . . .	...	1
" 6 " 7 " . . . .	...	4
" 7 " 8 " . . . .	...	1
Of 12 years' duration . . . .	...	1
Of 20 " " . . . .	...	1
Total	77	60 = 137

The apparent causes of torticollis, as noted in the records, were :

	Cases.
Enlarged cervical glands	5
Suppurating cervical glands	22
" glands following scarlet fever	11
Torticollis following scarlet fever, condition of glands not noted	7
Torticollis following diphtheria	4
" " mumps	5
" " measles	1
" " sore-throat	4
Suppurating otitis	3
Toothache	1
From cellulitis of neck	2
	65

Other causes were :

	Cases.
Cicatricial, following burns	3
Caused by injury of the neck	14
Probably of congenital origin	32
	49

OBSERVATIONS ON TORTICOLLIS. 13

Torticollis was associated with

Rheumatism	9 cases.
Fever	3 "
Malaria	4 "
<hr/>	
Total	16 cases.

Torticollis was associated with disease of the nervous system as follows :

Chorea	3 cases.
Epilepsy	1 case.
Cortical irritation	1 "
Hysteria	1 "
Infantile hemiplegia	1 "
Meningitis	1 "
Spasmodic torticollis	1 "
<hr/>	
Total	9 cases.

That duration of the affection is in itself a very potent factor in prognosis is illustrated by the in-patient records of 39 cases ; 17 were admitted when the deformity had persisted for less than six months. Of these 10 were cured, 4 were improved, and 3 were not improved. Of 15 cases of more than six months' duration none were cured, 6 were improved, and 9 were not improved.

ACUTE CASES.

Sex.	Age.	Duration.	Supposed cause.	Duration of treatment.	Result on discharge.
M.	15	3 days.	Cold.	3 weeks.	Well.
F.	9	4 months.	Abscess of angle of jaw.	10 months.	Not improved.
F.	9	3 months.	Measles.	4 months.	Well.
M.	8	2 weeks.	Injury.	4 months.	Much improved.
F.	9	3 weeks.	.....	4 months.	Much improved.
M.	9	2 months.	Abscess at neck.	4 months.	Well.
F.	8	2 months.	Mumps.	14 months.	Much improved.
F.	5	1 month.	.....	3 weeks.	Well.
F.	9	6 weeks.	Sup. glands after scarlet fever.	4 months.	Well.
F.	8	2 months.	Scarlet fever	3 weeks.	Well.
M.	8	1 month.	Injury	6 weeks.	Well.
M.	6	4 months.	Scarlet fever	15 months.	Not improved.
M.	4	5 months.	.....	9 months.	Improved.
M.	7	2 weeks.	Injury.	1 year.	Well.
F.	9	3 months.	Abscess of neck.	2 years.	Well.
F.	10	3 months.	Abscess after scarlet fever.	2 months.	Well.
F.	9	2 weeks.	Spasmodic torticollis.	1 month.	Well.

Results.

Well,	10	Average duration of treatment, 3 months.				
Improved,	4	}	"	"	"	11
Not improved,	3		"	"	"	"
Total,	17					

OBSERVATIONS ON TORTICOLLIS. 15

CHRONIC CASES.

Sex.	Age.	Duration	Supposed cause.	Duration of treatment	Result on discharge.
M.	10	9 months.	Cold.	1 year.	Much improved.
F.	14	Long.	Measles and mumps.	4 months.	Not improved.
F.	9	5½ years.	Enlarged glands.	3 months.	Not improved.
M.	9	7 years.	Scarlet fever.	3 months.	Not improved.
M.	7	2 years.	Myositis ossificans [sic].	1 month.	Not improved.
M.	8	7 months.	Enlarged glands.	6 months.	Much improved.
F.	8	1 year.	Nystagmus, hysteria, etc.	14 months.	Much improved.
F.	12	2 years.	Meningitis.	6 months.	Much improved.
M.	10	5 years.	Injury.	5 months.	Not improved.
F.	6	Long.	.....	7 months.	Not improved.
F.	12	8 years.	Scarlet fever.	4 years.	Not improved.
F.	8	1½ years.	Cervical abscess.	4 months.	Not improved.
F.	13	6 years.	After convulsions.	.....	Not improved.
F.	13	1 year.	.....	9 months.	Improved.
M.	10	9 months.	Cervical abscess.	9 months.	Much improved.

Results.

Well, None.

Improved, 6 Average duration of treatment, 8 months.

Not improved, 9 " " " " 9 "

Total, 15

It should be noted that with few exceptions these patients were treated at a time when operative interference was not recognized as an attribute of orthopedic surgery as practised at this institution, otherwise every recognized method of treatment

seems to have been employed, in most instances for many months. Of four cases of long standing treated recently by open incision, one was cured, two nearly cured, and one improved, the average stay in the hospital being but three weeks.

It seems fair to assume that there is an actual arrest of development in a contracted muscle, and that the more persistent the irritation, the more rapid the growth, the more marked will be the deformity. To overcome the contraction of such a muscle it must be overstretched to a degree corresponding to the amount of previous shortening. In the neck this is almost impossible by mechanical means when the affection has become chronic in character. This affords the rational indication for treatment: to hold the head by some appliance in perfect position from the outset of the affection when rectification is easy, especially if it appears to be caused by the presence of inflamed glands, which may persist long after the original source of irritation has been removed, not alone because rest is the proper treatment for inflamed glands, or for the relief of the strain upon the nervous system of a painful deformity of this character, in itself an important factor, but that we may not have the deformity-habit with shortened muscles and fascia to deal with when active contraction is no longer present. The removal of enlarged or suppurating glands, especially if they lie about the motor point of the contracted muscle, should certainly be considered. As this often necessitates a division of the sterno-mastoid we may at once take away the cause and remedy the result by this pro-

cedure. My time will not allow me to speak of other causes of wry-neck or of general considerations in treatment which must be governed by the indications in the individual case. They are sufficiently described in works upon this subject.

The induration that follows muscle-rupture usually disappears in from two to six months; if deformity is present, greater than may be explained by the character and size of the tumor, it is probably of intra-uterine origin and should be treated on the principles that apply to that affection—and, with certain modifications, to the acquired form that has persisted for any length of time; that is, free and early division of all contracted tissues that do not rapidly yield to milder methods, followed by the careful after-treatment which all cases of this character require. From the evidence presented, I think we may conclude, contrary to the prevailing theory, that the causes of congenital wry-neck operate in a majority of cases before birth rather than during delivery. That acquired torticollis in very young children may be as persistent in duration and as disastrous in its results as the congenital variety—the age of the child, the persistence of irritation, the arrest of development in the contracted parts, and the rapidity of growth being the determining factors—and that here, as elsewhere, the prevention of deformity in the first instance, or its rapid rectification if seen in the later stages, should be the object of our therapeutic efforts.

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